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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/423,155 11/02/99 HEILAND

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EXAMINER	

MM91/0815

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ART/UNIT	PAPER NUMBER
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DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/423,155

Applicant(s)

HEILAND, PETER

Examiner

Thanh X Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☒ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other:

## **DETAILED ACTION**

### ***Specification***

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

2. The disclosure is objected to because of the following informalities:

On pages 9 and 10, the numeral (2) in Figure 1(a) was not identified.

The embodiments of Figures 1(c) and 1(d) are also not described in the specification at all.

On pages 11 and 12, the numerals 3a and 3b in Figure 2 are not identified.

In Figure 6, the numeral 16 was not identified in the specification.

In Figure 8, the numeral 22 was not identified in the specification.

Appropriate correction is required.

### ***Claim Objections***

3. Claims 1, 4, 5, 9-13, 15, 16, 19-22, 26-36, 38, 40 and 41 are objected to because of the following informalities:

In claim 1, line 18, "the calibrated state" lacks proper antecedent basis. In lines 19-20, "the setting", "the transfer characteristic of the filter" and "the image degradation" lacks proper antecedent basis. In lines 15-16, it is unclear if "an actuator and/or control element" refers to the same actuator and/or control element as mentioned in line 12.

In claim 4, "the signal input" lacks proper antecedent basis.

In claim 5, "the manual calibration" lacks proper antecedent basis.

In claim 9, "the scanning device" lacks proper antecedent basis.

In claim 10, line 7, "the image" lacks proper antecedent basis. In line 9, "the real structure" lacks proper antecedent basis. In line 13, "the image defects" lacks proper antecedent basis.

In claim 11, line 5, "the digital image processing device" lacks proper antecedent basis. In line 7, "the image signal" lacks proper antecedent basis. In lines 7-8, "the said" is redundant. In line 10, "the difference" lacks proper antecedent basis. Further, it is unclear if "a reference object" refers to a different object or the same reference object as in claim 10.

In claim 12, lines 5-6, "the data" and "the basis" lacks proper antecedent basis. Further, it is unclear if "the object" refers to the reference object or another object to be imaged.

In claim 13, "the image mode" lacks proper antecedent basis.

In claim 15, "the temporal displacement" lacks proper antecedent basis.

In claim 16, "the cross-correlation" lacks proper antecedent basis.

In claim 19, "the electron beam" and "the sample" lacks proper antecedent basis.

In claim 20, "the light" and "the sample" lacks proper antecedent basis.

In claim 21, "the temporal displacement" lacks proper antecedent basis.

In claim 22, line 8, "the output signal" lacks proper antecedent basis. Further, it is unclear if "an electrical filter" refers to another filter or the same filter as in claim 1.

In claim 26, line 7-8, "the signal input" lacks proper antecedent basis. In lines 12-13, "the image", "the real structures" and "the reference object" lacks proper antecedent basis. Further, it is unclear if "a sensor" refers to another sensor or the same sensor as in claim 1.

In claim 27, line 6, "the interfering influence" lacks proper antecedent basis. In lines 15-16, "the acquired image" and "the real structure" lacks proper antecedent basis. In lines 17-18, "the difference" lacks proper antecedent basis. In lines 27-28, "the reduced image quality" lacks proper antecedent basis. In line 34, "the corrected image" lacks proper antecedent basis. In lines 40-41, "the determined transfer characteristic" lacks proper antecedent basis. Further it is unclear if "a sensor" and "a first signal" refers to another signal or sensor as in claims 1 and 26. Various other elements in the claim suffer from the same deficiencies.

In claim 28, line 7, "the digital filter" lacks proper antecedent basis.

In claim 29, it is unclear if "a sensor" refers to another sensor or the same sensor as in claim 1. It is also unclear if "an actuator and/or a control element" refers to the same actuator and/or control element as in claim 1 or not.

In claims 30, 31 and 34, "the recursive determination", "the displacement of the line centroids of successive image lines" and "this temporal displacement" lacks proper antecedent basis.

In claim 32, "the cross-correlation" lacks proper antecedent basis.

In claim 33, it is unclear if "an image acquisition device" refers to the same image acquisition device as in claim 1 or not. The same applies to "at least one actuator."

In claim 35, it is unclear if "means of actuators and/or control elements" refers to the same elements in claim 1 or not.

In claim 36, "the signal input of the filter", "the calibration input", "the image" and "the calibrated state" lacks proper antecedent basis.

Regarding claim 38, "the image", "the real structure", "the reference object", "the image defects" and "the calibration" lacks proper antecedent basis.

Regarding claims 40 and 41, "the temporal displacement" lacks proper antecedent basis.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-35 and 38-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, line 2, the terms "in particular scanning microscope" renders the claim indefinite since it is unclear whether the limitation is part of the claimed invention. In lines 18-19, it is unclear what is "characterized by the setting of the transfer characteristic of the filter." Furthermore, it is unclear how the acquisition of at least one pixel is functionally related to the rest of the invention.

Regarding claim 2, it is unclear if "at least one sensor" refers back to the same sensor as claimed in claim 1 or a different sensor. Further, it is unclear if "the first signal" is the same signal as in claim 1 or a different signals since the first signal in claim 1 is picked up while the first signal in claim 2 is outputted.

Regarding claim 6, it is unclear how an image degradation is reduced or compensated for.

Regarding claim 10, it is unclear what element is used to detect degradation or an image the object.

Regarding claim 11, line 10, it is unclear what "it" refers to. Further, it is unclear what a "difference" refers to; that is, a difference of or between what?

Regarding claim 21, it is unclear in its given context what "the first signal also being determined from the temporal displacement that is determined" is suppose to mean.

Regarding claim 22, the terms "in particular" renders the claim indefinite since it is unclear whether the limitation following the terms is part of the claimed invention. Furthermore, Applicant's method claims beginning with claim 22 are not really claiming method steps. For instance, the first signal is already claimed as being passed directly through the filter in claim 1. The dependency of a method claim (claim 22) from an apparatus claim (claim 1) complicates issues and results in various limitation conflicts with the apparatus claim. Examiner recommends separating the apparatus claims from the method claims.

Regarding claim 27, it is unclear what a "difference" refers to.

Regarding claim 33, it is unclear how a first signal is applied to the filter through the image processing device when the first signal is picked up by the sensor.

Furthermore, it is unclear if there is another image acquisition device and image processing device in the apparatus.

Regarding claims 33 and 34, claim 21 is an apparatus claim not a method claim.

The other claims are indefinite by virtue of their dependency on an indefinite claim.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 36 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Mizuno et al. (U.S. Patent 4,929,874).

Regarding claim 36, as understood, Mizuno et al. disclose (see Figure 1) an apparatus for compensating for ambient influences in imaging and/or raster-mode scanning apparatuses (see column 1, lines 20-23) that may degrade the imaging, comprising: a calibratable digital electrical filter (8); a regulating amplifier (11) which is electrically connected downstream of the filter; an actuator and/or control element (12) driven by the regulating amplifier, characterized in that a first signal (at A) dependent on the ambient influences can be passed via a signal input of the filter and a second signal



is applied (from 16) is applied to a calibration input of the filter; and the driven actuator and/or control element has an effect on the imaging, whereby, in a calibrated state of the filter, the image degradation is greatly reduced or essentially compensated for.

Regarding claim 37, as understood, Mizuno et al. disclose (see Figure 1) the apparatus further comprises at least one sensor (4) for detecting at least one physical quantity outside the apparatus, this sensor outputting the first signal which is dependent on the ambient influences at the location of the sensor.

8. Claims 1-5, 7-9, 13, 17-19, 21-23, 25, 29 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese Publication of Masaki et al. (08321274 published March 12, 1996).

Regarding claims 1 and 22, as understood, Masaki et al. disclose (see translated abstract and Figures) a method and an imaging and/or raster-mode scanning apparatus, having a compensation device for compensating for ambient influences that may degrade the imaging, comprising: an image acquisition device (7, 6, 13) for acquiring at least one pixel of an object, an image processing device (22) which is connected downstream of the image acquisition device, an image display device (8a), an electrical filter (17), a sensor (12) for picking up a first signal, and an actuator and/or control element (3), characterized in that the first signal (from 16a) dependent on the ambient influences passes through the filter directly and drives the actuator and/or control element which has an effect on the imaging and/or on the image display, in a calibration state of the apparatus which is characterized by a setting of a transfer characteristic of the filter, an image degradation is greatly reduced or essentially

compensated for, and the filter for calibrating the apparatus has a calibration input (from 22 or 20) and a second signal (from 22 or 20) is applied to the calibration input.

Regarding claims 2 and 3, Masaki et al. disclose (see Figure 1) the sensor (12) detects at least one physical quantity outside the apparatus and outputs the first signal which depends on the ambient influences at the location of the sensor. Mizuno et al. further disclose the sensor comprises at least one pick-up for air and/or ground vibrations.

Regarding claims 4 and 8, Masaki et al. disclose (see Figure 1) a signal input or a calibration input of the filter (17) is connected to an output of the image processing device (22).

Regarding claims 5 and 23, Masaki et al. disclose (see Figure 1) a device (20) for a manual calibration of the filter.

Regarding claims 7 and 25, Masaki et al. disclose (see Figure 1) the actuator (3) is assigned to a scanning device (a stage or mount) of the apparatus.

Regarding claim 9, the second signal of Masaki et al. inherently varies as a function of a scanning position of a scanning device and/or of time since the second signal comes from the image processing device.

Regarding claim 13, since the image processing device (22) inputs to the filter (17), the apparatus is set up for automatically (without human intervention) calibrating the filter during an image mode.

Regarding claims 17 and 35, Masaki et al. disclose (see Figure 1) actuators (3) for compensating in two mutually orthogonal directions.

Regarding claims 18 and 19, Masaki et al. disclose (see Figure 1) a scanning electron microscope. Masaki et al. further disclose (see Figure 1) the actuator comprises a device for deflecting an electron beam and/or a device for displacing a sample.

Regarding claim 21, Masaki et al. disclose (see Figure 1) a transmission electron microscope, the first signal being determined from a temporal displacement since a vibration is measured.

Regarding claim 29, Masaki et al. further disclose (see Figure 1) the claimed invention wherein an output of the filter is applied via a regulating amplifier (19) to the actuator and/or control element.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 6, 10-12, 14-16, 20, 24, 26-28, 30-34, 36 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Publication of Masaki et al. (08321274 published March 12, 1996).

Regarding claims 6 and 24, as understood, Masaki et al. do not specifically disclose a control element in the image processing device for compensating for image degradation. However, it would have been obvious to a person of ordinary skill in the

Art Unit: 2878

art at the time the invention was made to provide compensation directly through image processing rather than physical compensation of the device in the apparatus of Masaki et al. as well known in the image analysis and processing art in order to simplify and make compensation more efficient.

Regarding claims 10 and 26, degradation in the imaging inherently exists in the apparatus of Masaki et al. when the sensor detects vibration and the degradation is compensated for by the calibration of the filter. Masaki et al. do not specifically disclose comparing images in order to detect degradation. However, the manner in which the image degradation is observed is a matter of design choice. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to maintain the compensation during imaging in the apparatus of Masaki et al. to provide the best possible images.

Regarding claims 11 and 27, as understood, the microscope of Masaki et al. scans an object and the image processing device processes an image. Masaki et al. further disclose (see Figure 1) imaging processing image signals (in 22) and outputting a signal to the filter in order to compensate for any image degradation. Masaki et al. do not specifically disclose comparing images. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to detect degradation by comparing to a reference image since only then can any differences or defects be observed.

Regarding claims 12 and 28, as understood, Masaki et al. do not specifically disclose generating a second signal based on data previously obtained. It would have

been obvious to a person of ordinary skill in the art at the time the invention was made to refine the characteristic of the filter in image mode based on data obtained previously in the apparatus of Masaki et al. to provide improved compensation.

Regarding claims 14, 15, 30, 31, 33, 34 and 38-41, since the apparatus of Masaki et al. compensates for vibrations and has an image processing input to a filter, it determines a temporal displacement or the vibration characteristic of the image of an object being scanned. Masaki et al. do not specifically disclose centroid observation. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to observe centroids in the apparatus of Masaki et al. to reduce the complexity of the compensation.

Regarding claims 16 and 32, Masaki et al. do not specifically disclose cross-correlation. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to cross-correlate the signals in the apparatus of Masaki et al. to provide more accurate compensation.

Regarding claim 20, Masaki et al. disclose an electron microscope. Masaki et al. do not specifically disclose a light microscope. However, the type of microscope to apply the apparatus to is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a light microscope with such compensation in the apparatus of Masaki et al. to improve detection. Also, it requires only routine skill in the art to reconfigure the apparatus of Masaki et al. for different types of imaging devices or microscopes.

Art Unit: 2878

***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seungsook Ham, can be reached on (703) 308-4090. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl  
August 9, 2001



Que T. Le  
Primary Examiner